Mood Disorders Lab: Honors Thesis Guidelines

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Who typically does an Honors Thesis in the MDL?

The MDL gets lots of requests to advise honors theses. Unfortunately, we cannot accommodate everyone who would like to complete an honors thesis in the MDL. Typically, we supervise one or two honors theses a year, usually by students that have been working (or volunteering) in our lab for at least a year. Further, honors theses also need to be mentored by a graduate student or a postdoc who works in the MDL. This is a benefit for both the person who is completing the honors thesis, as they will get more individual attention, and for the graduate student/postdoc who gets the experience of supervising a student's research project. Dr. Beevers is available to consult on honors theses (particularly at the beginning of the project) but he typically cannot take on a primary supervisory role that helps with the day-to-day execution of the project.

Fundamentals and Guiding Principles

An honors or senior thesis can be one of the most rewarding things you do in your undergraduate career. It is an exciting and empowering process to watch your ideas take shape and become a fully fleshed-out thesis, sometimes even resulting in a publication. It can also,

however, be daunting at times, and can feel overwhelming. The intention of this guide is to set you up to tackle the process confidently and as stress-free as possible!

The best way to keep this process stress-free is to 1) start early, 2) plan ahead, and 3) understand your obligations and responsibilities. If you adhere to these three things, you should be in good shape.

> **Starting early:** there is never a “too early” when it comes to starting a thesis (or any project really). In fact, students usually underestimate the amount of time it takes to do things like a literature review or analysis… even writing a 250-word abstract can take A LOT of time. However long you think something might take, it’s probably a good idea to add 1-2 weeks of buffer time into your calculations. You are best off starting the process of a question in the spring (and definitely by the summer) of the year before you need to submit (i.e. spring of junior year).
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> **Plan ahead:** At the onset of the process, you should create a timeline with deadlines and milestones fleshed out. Some of these might be department-specific or even as part of an assignment for an honors course, so you should check those requirements to see if there is a certain date you need to have an outline, abstract, or literature review complete. For things that you need to run by us, you should plan for extra time as well. Please see the timeline later in the document for examples of how much time you should give your readers for editing.
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> **Own your thesis:** We are here to support and guide you throughout the process and you should ask for help as you need it. We may also check in from time to time just to see if you need anything. Your thesis is ultimately your responsibility, however, and it is expected that you will take the lead on the project. That means taking the time to look up things you don’t know, spending time reading the relevant literature so you have an understanding of the research landscape, and communicating deadlines and turnaround time clearly.
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> You are responsible for knowing the requirements and deadlines for the honors program. Students in the lab complete theses in multiple departments, so we are not apprised of all the requirements of different programs (same with any accompanying classes for the honors program). Even within psychology, there are often changes year to year, so you are expected to know the requirements and milestones you need to hit, and communicating them to us in a timely manner.

Timelines

We welcome the chance to help you grow as a researcher and are happy to meet about your project and review drafts of your thesis. However, research is messy and things rarely ever go exactly as planned. For this reason, we require things to be submitted early so that we have a

buffer in case something goes wrong. This not only protects you so that you'll be able to meet your honors requirements on time, but also ensures that we will be able to give you the attention and feedback you need. As multiple people will have to look over your thesis and multiple rounds of editing will happen, please respect these deadlines.

One of the first things you should do when preparing to do a thesis is to make a timeline. Below is an example that gives sufficient spacing for goals to be met and troubleshooting if problems arise (i.e. allowing 3 weeks for your committee to review your thesis). You are responsible for making the timeline, communicating the timeline with your primary advisor, and hitting your deadlines. If your first reader is in the lab, please send your timeline to your primary advisor before the start of fall semester.

To make a timeline, you should start with your deadline to present/submit and work backward. For example:

Date	**Milestone**
July/Beginning August	If doing data collection, submit IRB protocol
Fall	Data Collection begins (if applicable); conduct a literature review; write Introduction, Materials, and Methods sections
Mid-December	Before leaving for winter break, submit Intro, Materials and Methods to mentor
February/March	Wrap up Data Collection (if not already finished) Begin writing up results and discussion section
6 weeks before submission (~beginning of April)	Submit a ***full draft**** of your thesis to your first reader. Expect there to be 2-4 rounds of edits/revisions before the thesis goes to the full committee.
3 weeks before submission (~mid April)	Submit a final copy to committee
Early May	Departmental Honors Poster Session
Mid- May	Submission of Final Thesis to the Department

NOTE: These are fake dates and are not the actual deadlines for your program! Make sure you check and see when your program requires a first draft, how many pages are required by then, what sections, etc. If you're in an honors course, they might also require things at different

times. You can follow their format, just make sure you're giving us the same spacing for edits and feedback turnaround.

*A ***full draft*** is your best shot at the thesis, i.e. "If I had to submit this right now, this is the best I can get it on my own and this is what I would turn in." This shouldn't be an outline or a rough draft at this stage. If you are having trouble writing certain sections (Intro, results, etc.), we should be meeting about that and working on that before this point in time.

Developing a Research Question

The best way to get yourself started is to read… a lot. Sometimes ideas can come from observations you've made in the lab, or while working with participants, but ideas really become research questions through the process of reading. When you have a general idea in mind, searching through publications on that topic can be helpful in getting a grasp on 1) how this concept is typically measured; 2) what gaps are in the current literature (and what has already been studied extensively); and 3) what issues and limitations might often arise in this type of research that you haven't yet considered. Review articles (especially ones published in the last 5-10 years) can be especially helpful for this, but you should also read through some of the more seminal works in the field you're studying, even if they are older.

At the end of this process, you should have narrowed down a couple of concrete ideas that you'd potentially be interested in researching (3-5 is a good number). They should be either novel ideas that fill some gap in the literature or research questions that would provide further support for some phenomenon for which the jury is still out.

In general, the most tractable ideas for honors theses represent a relatively small step forward from what has already been done in the published literature. Do not feel pressure to develop an entirely new idea or theory about a phenomenon. In fact, it is often important to replicate what has already been done! (A surprising number of findings often do not replicate). It is also important to develop an idea (whether or not you are collecting new data, see below) that is feasible. If you do plan to collect new data, this probably means using the subject pool of 301 students. It also means keeping your research method relatively simple (e.g., self-report), as it often takes quite some time to become competent in complex data collection methods (e.g., eye tracking, EEG, fMRI, etc.), particularly if you have no relevant experience in that area. In many cases, using existing data (either from our lab or from public data repositories) is a very pragmatic option.

Reference Manager

You should have a citation manager that you use throughout the process to organize your references (Mendeley and Zotero are both widely used and free). These will format the references for you in APA style.

You should start using this at the very beginning of the process so that all of your sources are in one place. There is nothing worse than combing through your browser history trying to find that one paper out of the million you just read. You'd also be wise to add notes or tags to the paper when you save it so you can easily search for them in your reference manager library. For example, you might save a paper with the tag, "Contains a nice review of attention bias" or "See this reference for methods on how to set up XYZ." It's a small thing that adds up when it comes time to start writing the actual thesis.

To Collect or Not Collect, That is the Question

Some research questions can be answered with data that's already been collected (either in our lab, or that is publicly available online). If your question can be answered using already-collected data, you are encouraged to utilize this option. You'll be able to begin the analysis portion of your thesis sooner, and we won't duplicate efforts. This is smart science and is becoming more of a norm across the field to share and reanalyze data that may have originally been collected for other purposes. (Anecdotally, this is how most psychology doctoral students first get started in graduate school-- by analyzing pre-collected data). There are a number of ways you can locate data. Google has a search engine specifically for datasets. Also, many people post their data on the Open Science Framework. If there is a leading researcher conducting research in your area, then you might want to see if they have posted links to their data on their lab website (see the MDL website for an example).

If you have a question that cannot be answered with any available data, then data collection is definitely an option. However, it is important you fully understand the scope of your responsibilities before the start of data collection. You will be responsible for writing/amending the IRB protocol, ensuring the protocol is finished before the IRB meeting dates, and managing the timeline of the study. We will, of course, be there to answer questions and troubleshoot, but the onus is on you to manage the protocol and the timeline. For example, for a Spring thesis deadline, you will want to have completed data collection in the Fall semester. This means the IRB protocol has to be approved in the summer (around August) in order to start data collection early enough to run participants. There is often (read: always) back and forth with the IRB when submitting protocols too, so you should plan generously for several weeks/months before the protocol is approved.

Building a Team

For some projects, you might need more than just yourself to run participant sessions. This means you might need to recruit and train RAs to help run these sessions. We have materials you can use to put out applications for RA positions, interview applicants, and then for onboaring and lab orientation, so make sure to ask about those. Again, it will be up to you to manage your team, but we can provide you will all of these resources and helpful advice so you don't have to reinvent the wheel. However, if you build a team, it will be very important for you to keep your supervisor in the loop on this and to make sure everyone is well trained and

trustworthy. You will ultimately be responsible for what your team does, for better or worse. Note that data for most honors theses are typically collected primarily by the honors thesis student.

Writing Expectations

The University Writing Center (http://uwc.utexas.edu/) has tons of resources on writing and it is easy to make an appointment with a writing tutor to go over the process of putting together an outline, an introduction, etc. We will, of course, help you with editing, so your writing is not expected to be perfect (no one's is!), but you are strongly encouraged to use the UWC as a resource for initial composition and first drafts.

The following guide has great information about how to structure a thesis, and how it is different from writing manuscripts or other papers you may have been involved in.

Thesis Formatting and Content

(from Writing and Defending an Honors Thesis in IPHY: Student Guide forwarded by Janet Jacobs from Dave Sherwood)

1. General Guidelines

An Honors thesis should follow the general format of a peer-reviewed publication in your research area following APA style, but should contain a more extensive background and discussion section, as well as include justification for the formation of your hypotheses and predictions. This means that you should use (1) headers for sections and sub-headers for subsections, include an (2) abstract, (3) an introduction that ends with a clear hypothesis or question, (4) a materials and methods section, (5) a results section with figures and tables, (6) a discussion section, (7) a brief conclusion section (optional), and (8) a reference list. In addition, you must include a (9) title page (see a page 9 of this document). For more detailed descriptions of these sections, see below.

(1) Headers and Subheaders: These include the names of sections (i.e., Abstract, Introduction, etc.), as well as natural subsections within those sections (e.g., Data Collection, Data Analysis, etc.)

(2) Abstract: This is a brief summary of your research that includes 1-2 sentences of introduction, 1-3 sentences of methods, 1-3 sentences of results and conclusions, and 1-2 sentences for how the research impacts the field at large. This should not exceed 250 words, typically one page.

(3) Introduction: Introduce the topic that you are studying and clearly demonstrate a need for your research (i.e., an open gap or question), and tie this to a rationale for choosing your topic. The Introduction should be broader than it is in typical

peer-reviewed empirical publications and must be accessible to people who are not actively conducting research in this field. You should introduce all concepts and define all technical terms and abbreviations for non-expert readers. The purpose of this section is to lead into your hypotheses and predictions, so that readers understand why you are asking certain questions, and why you are predicting certain results. Be sure to clearly state your research question including hypotheses and predictions, giving justification for why you think what you do. Provide a short general introduction ending with your hypotheses, and follow up with a Background section after this brief introduction.

(4) Materials and Methods: This section is a detailed description of how you performed your study and how you analyzed your results. Using past tense, include everything necessary to completely replicate your experiment, from the statistical program you used to analyze your results, to the equipment used. For equipment and reagents provide the name of the company from which they were purchased and the location of the company's headquarters.

(5) Results: Using past tense, succinctly report your results using text, figures, and tables. You can embed the figures and tables in the text or place them at the end of your paper. Be sure to provide supporting statistics for the results you present. Do not discuss or analyze results further in this section! If you include figures, do not report results in legends of figures or tables or simply restate numbers and data points. Figure captions should include a first sentence that clearly indicates what results are shown in the context of your research question, followed by a brief statement of any context for results (e.g., the treatment applied or the relationship displayed, etc.), the subjects (and sample size) studied in the experiment, a key to any abbreviations used, and statistical test annotations. Look at figures in peer-reviewed publications in your research area for examples to work from. Refer to all tables and figures in the text (e.g., see Table X), and also indicate the main "take home point" about the figures/tables in the text.

(6) Discussion: In this section, summarize and interpret results, discuss potential strengths and weakness of the results in a constructive manner, talk about other studies that either contradict or corroborate your results, and present possible future research. Do not list your results in any detail again; you may refer to figures/tables to selected cases. Be sure to highlight how your data provide some novel insight. It is important to have a structure to your discussion; it often works well to discuss your overall findings first, and then individual findings in the same order as in the Results section.

(7) Conclusions. This is a brief, concise statement of the most important findings of your research and how they are immediately interesting to the audience. This section is optional, because you may be able to cover this in your discussion.

(8) Reference List. List all previous literature/studies that you cited in your paper. Do not wait to compile your reference list until the last draft! For every draft you submit,

your committee will want to see the list of research and documents you are relying on. The purpose of the reference list is to demonstrate to your readers that you have read enough to be a credible researcher and lend credence to your study and findings. Follow the format of citations in a sample peer-reviewed publication in your research area, and keep it consistent. Be sure to spell out the journal names. See example below:

Arnett, A. B., Pennington, B. F. Willcutt, E. G., DeFries, J. C., & Olson, R. K. (2015). Sex difference in ADHD symptom severity. *Journal of Child Psychology and Psychiatry*, 56, 632-639. Doi:10.1111/jcpp.12337

(9) Title Page: In your thesis, you should communicate information in a succinct professional writing style, like in a peer-reviewed publication, and should not use colloquial or "lab" jargon. Be sure to check your grammar and punctuation! The thesis should flow from one section to another – your introduction should set up the need for your project, your methods should clearly demonstrate how you filled that gap, your results should show how the gap was addressed and/or filled, and your discussion should expound on the results and show how your study leaves room for other studies and creates more gaps to be filled and questions to be answered. Every section should begin with "hints" that keep the reader informed about what is coming and why. There should typically be no direct quotes from previous research; paraphrase ideas and give citations for all thoughts, ideas or results reported. Whenever you make a statement of fact, you must support this claim using previous research. Use in-text citations at the end of every sentence that reference another scientist's work following the format of a peer-reviewed publication in your research area; e.g., (Møller et al. 2009). Et al. (for et alii) means "and others" and should be used for research that has more than six authors.

Analyses

You are encouraged to be an active participant in the analysis stage of your thesis. You are not expected to know everything and will probably receive the most lab support in this phase of the project, so it's important to plan ahead for this out of respect for the time others will be contributing.

You will likely consult with your first reader or a graduate student about what analytical plan to take. An ambitious honors student will have already fleshed out a data analysis plan with an advisor and will be meeting with them in January to execute and interpret analyses.

If the analysis is complex, someone in the lab might take more of the reins on the execution. This is okay. You are still responsible for understanding the methods being used, and interpreting the results accurately in your results and discussion sections. There are excellent resources for learning stats as well as R-- many of them are in our lab Box folder.

Publications/Authorship

It is exceedingly rare that honors theses get published, however, it does happen from time to time. Sometimes, we might decide to pursue a publication grounded on a student's thesis work, but the student may not be the first author on a paper. This usually happens when the student has left the lab and someone else is taking the reins on getting the project to publication standards, additional or completely new analyses were conducted, or the paper has taken a different direction from the student's original project. In these instances, the honors student would still be credited in the manuscript, they just may not be the first author on the publication. See the below lab guidelines for how authorship is usually determined:

As a lab, we use guidance from the International Committee of Medical Journal Editors about how to determine authorship. The ICJME suggests that authorship should be based on the following four criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

This advice is also in line with APA guidelines with respect to authorship:

> "Authorship credit should reflect the individual's contribution to the study. An author is considered anyone involved with initial research design, data collection and analysis, manuscript drafting, and final approval. However, the following do not necessarily qualify for authorship: providing funding or resources, mentorship, or contributing research but not helping with the publication itself. The primary author assumes responsibility for the publication, making sure that the data are accurate, that all deserving authors have been credited, that all authors have given their approval to the final draft; and handles responses to inquiries after the manuscript is published."

We also aim to include in the manuscripts a brief description of the contributions for each author so that authors are given appropriate credit for the work that is done. All authors should also have confidence in the work and integrity of the contributions of their co-authors. Please see the ICMJE guidelines for more detail.

Ideally, authorship order is generally determined prior to starting the work. The first author, typically (but not always) the corresponding author, is primarily responsible for the project (e.g., dissertation study). This person typically had a central role in the conceptualization, execution, and analysis of the study and moving the manuscript through the submission and review

process at a journal. People that played a less central role (but still qualify for authorship based on the above criteria) are typically included as middle authors. Chris is typically included as senior author (last author), although there may be some circumstances when Chris is not included as an author (e.g., collaboration between students and faculty in another lab that did not involve Chris) or is not listed as senior author (e.g., collaborations with other labs).

At the start of a project, it is typically assumed that the student or postdoc heading up the project will have the first author role. Please note that as roles on a project change, so too can authorship roles. While it is a good idea to talk about authorship from the beginning, sometimes even the best laid plans do not materialize and roles may change. It is important to be flexible and understand that even if you initially thought you were going to be the first author, if your role substantially changes, your authorship may also change. If this is the case, it should be part of an ongoing conversation as the project unfolds. If you have concerns about authorship, do not hesitate to talk to Chris or your colleagues about it. Note that the COPE group provides some guidance about how to handle authorship disputes.